REMARKS

Claims 1-9 are all the claims pending in the application.

Preliminary Matter

As a preliminary matter, in the Office Action mailed March 30, 2004, the Examiner has acknowledged Applicant's claim for foreign priority and has indicated that the certified copy of the priority document has been received *from the International Bureau*. However, Applicant has filed *with the USPTO* the certified copy of the priority document on May 23, 2001. Applicant respectfully requests the Examiner to clarify this point in the next office communication.

Summary of the Office Action

The Examiner maintained the rejection of claims 1-9 under 35 U.S.C. § 102(b).

Prior Art Rejections

Claims 1-9 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,844,951 to Proakis et al. (hereinafter "Proakis"). Applicant respectfully traverses these grounds of rejection in view of the following comments.

Independent claim 1 recites: "processing a first combining algorithm (B1) for providing a resulting signal (S1), and a second, differing combining algorithm (B2) for providing a second resulting signal (S2); and combining the two resulting signals (S1 and S2), wherein the combination depends on the two resulting signals (S1, S2)." That is, in an exemplary, non-limiting embodiment, an algorithm is processed to result in a signal S1 and a second, differing algorithm is processed to result in a signal S2. Then, the two resulting signals S1 and S2 are combined (*e.g.*, Fig. 3).

The Examiner contends that claim 1 is directed to a method of combining two received signals and is anticipated by Proakis. Specifically, the Examiner maintains that "Proakis at least eventually meets all of the claiming features; because Proakis later points out in Fig. 2 and col. 12/line 56 to col. 13/line 14 for spatial signal processing algorithm and temporal processing algorithm is jointly optimized at the combining means 38 to ensure optimal performance at the receiver…." (*see* page 5 of the Office Action).

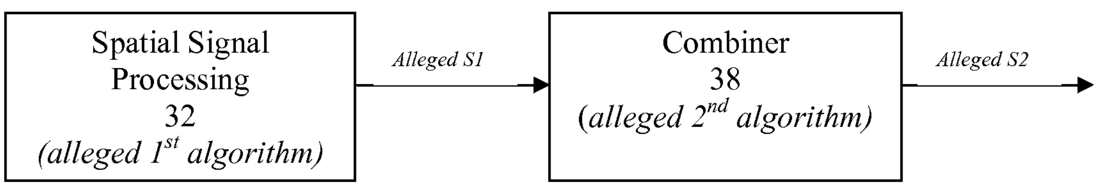
Applicant respectfully submits, however, that Proakis discloses the signals output by the spatial signal processing 32 being input into the combiner 38. In other words, in Proakis, the signal output from the spatial signal processing 32 is not combined with the signal output from combiner 38. That is, in Proakis, each signal is first subject to the spatial signal processing and then to the processing in the combiner.

The maintained grounds of rejection rely on Fig. 2 and col. 12, line 56 to col. 13, line 14 of Proakis. Col. 12, line 56 to col. 13, line 14 of Proakis recite:

> Referring now to FIG. 2, a reduced complexity multichannel receiver 30 is shown. The front part of the receiver 30 includes spatial signal processing means 2-12 which is provided as a K * P reduced complexity combiner. Spatial signal processing means 32 is preceded by a multichannel digital phase locked loop (DPLL) 34. The reduced complexity combiner reduces the K channel signal into a P channel signal which are fed to a bank of P-channel feed forward equalizers 36 (emphasis added).
>
> A temporal processing and final combining means 38 is coupled to the spatial signal processing means 32 through the P-channel equalizer 36. The bank of P feedforward equalizers 36 may be provided as T/2-spaced transversal filters which accomplish adaptive match filtering and linear equalization (emphasis added).

> In the reduced complexity multichannel receiver 30, the spatial and temporal processor components have been jointly optimized to ensure optimal performance of the receiver 30 while at the same time providing the advantage of reduced complexity. In a narrow-band case if the reduced number of channels to be equalized, P, is greater than or equal to the number of propagation paths, the reduced complexity multichannel receiver 30 can achieve the same performance as its full complexity counterpart.

In other words, as is visible from the above-quoted passages, Proakis discloses a spatial signal processor/combiner 32 and then a temporal processor/combiner 38. That is, in Proakis, the resulting signals from the spatial signal processing 32 (*alleged first algorithm*) are provided to the combiner 38 (*alleged second algorithm*) via the equalizer 36 (Fig. 2), *see* simplified diagram of Fig. 2 of Proakis, below.



In other words, in Proakis, there is no disclosure or suggestion of combining the two resulting signals (where each signal results from a different algorithm). In Proakis, both algorithms are applied to all signals such that the resulting signals from the alleged first algorithm (spatial signal processing 32) are provided to the alleged second algorithm (combiner 38).

Therefore, "processing a first combining algorithm (B1) for providing a resulting signal (S1), and a second, differing combining algorithm (B2) for providing a second resulting signal (S2); and combining the two resulting signals (S1 and S2), wherein the combination depends on the two resulting signals (S1, S2)," as set forth in claim 1, is not disclosed by Proakis, which

lacks combing the resulting signal from the first combining algorithm with the resulting signal from the second combining algorithm. For at least these exemplary reasons, independent claim 1 patentably distinguishes over Proakis. Accordingly, it is appropriate and necessary for the Examiner to withdraw this rejection of claim 1 and its dependent claims 2-5.

Dependent claim 2 recites that the quality of the two resulting signals is estimated. Proakis does not disclose or suggest estimating the quality of the two resulting signals. As explained above, sensors are used for sensing the condition or quality of just received signals (col. 3, lines 23-47) and not the already processed signals. For at least these additional exemplary reasons, claim 2 patentably distinguishes over Proakis.

Dependent claim 3 recites "wherein the estimated quality of the two resulting signals (S1, S2) is used to weight the combination of the two resulting signals." The grounds of rejection appear to suggest that the combiner 20 (Fig. 1) or 38 (Fig. 2) is now both one of the algorithms and the weighing, as set forth in claim 3. However, this is clearly inconsistent. The combiner 20 or 38 of Proakis cannot and does not weight a signal resulting from that same combiner. That is, the combiner of Proakis cannot be both a quality estimator and the algorithm at least because it is the quality of the signal resulting from the processed algorithm that is being estimated. For at least these additional exemplary reasons, claim 3 patentably distinguishes over Proakis.

Next, independent claim 6 recites features similar to, although not necessarily coextensive with, the features argued above with respect to claim 1. Therefore, arguments presented with respect to claim 1 are respectfully submitted to apply at least by analogy here. For at least substantially analogous reasons, therefore, independent claim 6 is patentably distinguishable from Proakis.

Independent claim 7 recites *inter alia*: "selecting from a plurality of differing algorithms, one or more algorithms to process the plurality of the signals, based on the condition of the signals; and selecting one of the processed signals as a representative signal." In an exemplary, non-limiting embodiment of the present invention, the received signals are applied to different algorithms (*e.g.*, first and second algorithms) resulting in respective signals S1 and S2. The decision block then selects one of the two resulting signals S1 and S2 (*e.g.*, Fig. 2).

The grounds of rejection for claim 7 essentially repeat the claim features, while citing the same sections as in the rejection of claim 1 (*see* pages 4 and 5 of the Office Action). Applicant respectfully submits, however, that there is no disclosure in Proakis of selecting one of the signals processed by various algorithms as a representative resulting signal. In Proakis, the signals are combined at combiner 20 (Fig. 1) or combiner 38 (Fig. 2), a plurality of these combined signals are sent to the equalizer circuits 22a-22p (Fig. 1), and then the signals are sent to a summer circuit 26 (Fig. 1). In short, in Proakis, a representative resulting processed signal is not selected, but rather the signals are processed, combined, equalized, and then summed (col. 4, line 62 to col. 5, line 5).

The grounds of rejection further note that Proakis discloses a plurality of sensors provided for sensing the condition of the received signal (*see* page 4 of the Office Action). The relevance of the Proakis' sensors is not understood. The grounds of rejection rely on col. 3, lines 23 to 47 of Proakis, which recites:

> The receiver can demodulate and detect digital data signals received from multiple sensors. The multichannel receiver may be fed signals, for example, from an array of hydrophones in an underwater communications system. The underwater communication channel through which the data

> signal is transmitted is time dispersive and distorts the transmitted signal in a way that is unknown to the receiver. The means adaptively combine and equalize the received signals from the hydrophone array. The means adaptively combine the signal components in an optimal way and adaptively equalizes the channel distortion. For example, when the mean square error is used as a criterian for optimizing the combiner equalizer, the combiner is the same as if the maximum likelihood sequence estimation criteria were used in the design of the receiver. Regardless of the optimization criteria used, the combiner remains the same. The jointly optimized combiner/equalizer is operated in an adaptive manner in accordance with a pre-determined algorithm. The algorithm may, for example, be based on a combination of a recursive least squares (RLS) scheme to generate equalizer tap-weight updates and a second-order digital phase-locked loop (DPLL) to generate carrier phase estimates. One example of an RLS algorithm which may be used in this scheme is a fast, numerically stable implementation of a transversal RLS.

That is, the above-quoted passage of Proakis only discloses that the receiver detects data from a number of sensors. Further, Proakis discloses that a receiving system 14 includes a sensor array 16 having a plurality of sensors 16a-16K. The sensors 16 may be provided for example as an array of hydrophone sensors in an underwater communication system or alternatively sensor array 16 may be provided as an antenna array in an RF communication system. The sensors 16 receive the signal transmitted by signal source 12 and provide input signals $v_0(t)$-$v_{K-1}(t)$ to one of a corresponding plurality of sampling circuits 18a-18k (Fig. 1; col. 4, lines 45 to 61). That is, the sensors of Proakis sense the signal condition as it is received, not after it has been processed, *i.e.*, not the signal processed by one of the algorithms.

Therefore, "selecting from a plurality of differing algorithms, one or more algorithms to process the plurality of the signals, based on the condition of the signals; and selecting one of the

processed signals as a representative signal," as set forth in claim 7 is not disclosed by Proakis, which lacks selecting a representative signal from signals that result from processing signals by various algorithms. For at least these exemplary reasons, independent claim 7 patentably distinguishes over Proakis. Therefore, Applicant respectfully requests the Examiner to withdraw this rejection of claim 7.

Independent claims 8 and 9 recite features similar to, although not necessarily coextensive with, the features argued above with respect to claim 7. Therefore, arguments presented with respect to claim 7 are respectfully submitted to apply at least analogously here. For at least these substantially analogous reasons, therefore, independent claims 8 and 9 patentably distinguish over Proakis.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly invited to contact the undersigned attorney at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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